



DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R8-ES-2013-0116]

[4500030113]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to Reclassify *Eriodictyon altissimum* as Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service, announce a 12-month finding on a petition to reclassify *Eriodictyon altissimum* (Indian Knob mountain balm) as a threatened species under the Endangered Species Act of 1973, as amended (Act). After review of the best available scientific and commercial information, we find that

reclassifying *E. altissimum* as threatened is not warranted at this time. However, we ask the public to submit to us any new information that becomes available concerning the threats to *E. altissimum* or its habitat at any time.

DATES: The finding announced in this document was made on [INSERT DATE OF FEDERAL REGISTER PUBLICATION].

ADDRESSES: This finding is available on the Internet at <http://www.regulations.gov> at Docket Number FWS–R8–ES–2013–0116. Supporting documentation we used in preparing this finding is included in the docket at <http://www.regulations.gov> and available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003. Please submit any new information, materials, comments, or questions concerning this finding to the above street address.

FOR FURTHER INFORMATION CONTACT: Stephen P. Henry, Deputy Field Supervisor, U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003; telephone 805–644–1766; facsimile 805–644–3958. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Previous Federal Actions

We proposed to list *Eriodictyon altissimum* as an endangered species under the Act (16 U.S.C. 1531 *et seq.*) on December 23, 1991 (56 FR 66400), based primarily on loss of habitat that was anticipated to result from residential development, surface mining, and oil well drilling. A final rule listing *E. altissimum* as endangered was published in the **Federal Register** on December 15, 1994 (59 FR 64613). In September 1998, we finalized a recovery plan for *E. altissimum*, three other federally endangered species (the Morro shoulderband snail (*Helminthoglypta walkeriana*), *Cirsium fontinale* var. *obispoense* (Chorro Creek bog thistle), and *Clarkia speciosa* ssp. *immaculata* (Pismo clarkia)), and one federally threatened species (*Arctostaphylos morroensis* (Morro manzanita)) (Service 1998).

We published a notice of review and request for public comments concerning the status of *Eriodictyon altissimum* under section 4(c)(2) of the Act on March 22, 2006 (71 FR 14538). A second notice was published on April 3, 2006 (71 FR 16584) to clarify the contact offices. We notified the public of completion of the 5-year review on May 21, 2010 (75 FR 28636). The 5-year review resulted in a recommendation to change the status of the species from endangered to threatened. We acknowledged in the review that the recovery criteria had only been partially met. However, we still made the recommendation to downlist because the status of the species appeared to be self-sustaining and stable (Service 2009, p. 11). We also made the recommendation based on a substantial reduction of the primary threat at the time of listing (i.e., habitat loss as a

result of development); this threat was reduced as a result of conserving lands where the species occurred in the Los Osos and Indian Knob areas. Therefore, based on the best scientific and commercial information available at that time, we concluded that the species now best met the definition of threatened rather than endangered (Service 2009, p. 11).

On December 21, 2011, we received a petition dated December 19, 2011, from the Pacific Legal Foundation, requesting the Service to delist the Inyo California towhee (*Pipilo crissalis eremophilus*), and to reclassify from endangered to threatened *Eriodictyon altissimum*, *Astragalus jaegerianus* (Lane Mountain milk-vetch), *Hesperocyparis abramsiana* (= *Cupressus abramsiana*) (Santa Cruz cypress), arroyo toad (*Anaxyrus californicus*), and Modoc sucker (*Catostomus microps*). The petition was based on the analysis and recommendations contained in the most recent 5-year reviews for these taxa. On June 4, 2012 (77 FR 32922), we published in the **Federal Register** a 90-day finding for the 2011 petition to reclassify these six taxa. In our 90-day finding, we determined the 2011 petition provided substantial information indicating the petitioned actions may be warranted, and we initiated status reviews for each species. This 12-month finding also constitutes our 5-year status review for *E. altissimum*. The 12-month findings for *H. abramsiana* and Inyo California towhee published in the **Federal Register** on September 3, 2013 (78 FR 54221), and November 4, 2013 (78 FR 65938), respectively; the other petitioned species will be addressed separately and findings published in the **Federal Register** in the future.

Background

A scientific analysis was completed and presented in detail in a species report for *Eriodictyon altissimum* (Service 2013, entire), which is available at <http://www.regulations.gov> at Docket No. FWS–R8–ES–2013–0116. The species report was prepared by Service biologists to provide a thorough discussion of the species' ecology, biological needs, and analysis of the threats that may be impacting the species. The species report includes discussion of the following: species description, taxonomy, life history, habitat, soils, distribution, abundance, age and size distribution, role of fire in regeneration, and an assessment of threats currently acting on the species. This detailed information is summarized in the following paragraphs of this **Background** section and the **Summary of Factors Affecting the Species** section.

Eriodictyon altissimum is a relatively weak-stemmed evergreen shrub that was originally placed in the waterleaf family (Hydrophyllaceae) (Halse 1993, pp. 683–708), but is now included in the borage family (Boraginaceae) (Kelley *et al.* 2012, pp. 450–511). While some individuals can achieve heights in excess of 13 feet (ft) (4 meters (m)), most are observed in the height range of 5 to 6 ft (1.5 to 2 m). Little specific scientific information exists in the literature for *E. altissimum*; as such, much of the information in the species report includes inferences from other species in the genus *Eriodictyon*.

Like most species in the genus, *Eriodictyon altissimum* displays an open growth pattern and embodies those characteristics typical of a pioneer (early successional)

species (e.g., shade-intolerant, poor competitor). It is a rapid-growing, short-lived shrub commonly observed along roadsides or trails, or within open areas of chaparral (CNPS 1978, p. 1; Wells 1962, p. 186; Vanderwier 2006, 2009, pers. obs.). While pollination ecology has not been specifically studied for *E. altissimum*, other *Eriodictyon* species are pollinated by wasps, butterflies, and a variety of bee taxa (Moldenke 1976, p. 356).

Eriodictyon altissimum, like the closely related *E. capitatum*, likely evolved in communities where fire is an integral ecological process; therefore, fires are presumed to play an important role in the persistence and reproduction of populations (Service 2002, p. 67969). Similar to other species in the genus, *E. altissimum* is thought to be a pioneer, or early successional, species and similarly adapted to periodic fire in its associated community (Service 1998, p. 23). A variety of short-lived subshrubs (including *Eriodictyon* spp.) germinate the first year following a fire and form an important element of stand structure in the first few years of succession. Fire cues, such as heat and charred wood, have been found to significantly increase the germination of *Eriodictyon* species (Keeley 1987, p. 438; Service 2002, p. 67969). Absent fire to cue seed germination, *Eriodictyon* species most often reproduce, or spread, via rhizomes.

Eriodictyon altissimum is a constituent of the maritime chaparral community found along the central California coast where a Mediterranean climate (warm dry summers, cool wet winters) prevails. The species occurs in two areas in western San Luis Obispo County: (1) Near the community of Los Osos (inclusive of Montaña de Oro State Park), approximately 11 miles (mi) (17 kilometers (km)) west of the city of San

Luis Obispo (City); and (2) the Indian Knob area, approximately 5 mi (8 km) south-southeast of the City. The Los Osos area supports three extant occurrences (Ridge Trail, Hazard South, and Water Tank). It also supports habitat for two occurrences which, due to surveys conducted since the publication of the 2009 5-year review, we now consider to be extirpated (Broderick and Morro Dunes) (Service 2013, p. 5; Table 1). The Indian Knob area supports two occurrences (Indian Knob and Baron Canyon) (Service 2013, p. 4).

An accurate metric regarding the abundance, or number of plants, of *Eriodictyon altissimum* at any given occurrence is difficult to determine because this species, as with others in the genus *Eriodictyon*, commonly produces aboveground stems asexually from rhizomes (Wells 1962, p. 184; Howard 2012, p. 4; Service 1998, p. 21). Some aboveground stems that arise from rhizomes are often counted as genetically distinct individuals; however, they may actually represent a genetically identical expression (clone) of the source plant, as is the case in the closely related *E. capitatum* (Lompoc yerba santa) (Elam 1994, pp. 146–194), a species found in habitat similar to where *E. altissimum* grows.

Eriodictyon altissimum may also exhibit self-incompatibility (a general term for genetic mechanisms which prevent self-fertilization) similar to *E. capitatum*. Low seed production in *E. capitatum* has been attributed to the combined effects of self-incompatibility and single-clone populations (Elam 1994, pp. 146–194). That is, single

clone (one genotype) populations produce low numbers of fertile seeds relative to multiclonal (several genotype) populations.

Summary of Biological Status and Threats

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR 424) set forth procedures for listing species, reclassifying species, or removing species from listed status. “Species” is defined by the Act as any species or subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature (16 U.S.C. 1532(16)). A species may be determined to be an endangered or threatened species because of any one or a combination of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

Determining whether the status of a species has improved to the point that it can be downlisted or delisted requires consideration of whether the species is endangered or threatened because of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as endangered or threatened, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting or downlisting and the removal or reduction of the Act’s protections.

A species is an “endangered species” for purposes of the Act if it is in danger of extinction throughout all or a significant portion of its range and is a “threatened species” if it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The word “range” in the “significant portion of its range” phrase refers to the range in which the species currently exists. For the purposes of this analysis, we first evaluate the status of the species throughout all its range, then consider whether the species is in danger of extinction or likely to become so in any significant portion of its range. In the case of *Eriodictyon altissimum*, the latter step is unnecessary, since it is designated as endangered throughout all of its range.

The following sections provide a summary of the threats impacting *Eriodictyon altissimum*. These threats include: loss of habitat (Factor A), competition with nonnative species (Factors A and E), lack of fire (Factors A and E), small population size and limited distribution (Factor E), and climate change (Factor A). Additionally, the existing regulatory mechanisms are inadequate to protect the species from these threats (Factor D).

Loss of Habitat

At the time of listing, the primary threat to *Eriodictyon altissimum* was loss of habitat that was anticipated to result from residential development, surface mining, and oil well drilling (Factor A) (59 FR 64613, December 15, 1994). This primary threat

remained at the time the recovery plan was completed in 1998, with habitat loss predicted from surface mining and oil well drilling in the Indian Knob area and residential development in the Los Osos area. Since the completion of the recovery plan, the threats from loss of habitat have been reduced. As discussed in the species report, the 2009 5-year review, and the **Recovery and Recovery Plan Implementation** section below, four of five extant occurrences are now protected in perpetuity. Furthermore, habitat occupied by *E. altissimum* in Los Osos that was once at risk from proposed residential development as part of the Morro Palisades development project is now conserved as part of the Morro Dunes Ecological Reserve, which is owned and managed by the California Department of Fish and Wildlife. Currently, the only occurrence at potential risk from development activities is the Baron Canyon occurrence. Therefore, we no longer consider habitat loss from residential development, surface mining, and oil well drilling activities to pose a substantial threat to the continued existence of *E. altissimum*. See additional discussion in the “Threats at the Time of Listing” section of the species report (Service 2013, pp. 9–11).

Competition with Nonnative Species

The invasion of nonnative species into the habitat of *Eriodictyon altissimum* can affect both the species and its habitat. Habitat degradation resulting from the spread of invasive, nonnative plant species was not identified as a specific threat to *E. altissimum* in the 1994 listing rule. At the time the recovery plan was prepared in 1998, we had not yet identified invasive plant species as a threat requiring management; however, the recovery

plan did provide information on encroachment of several nonnative species into the coastal dune scrub and maritime chaparral communities that support *E. altissimum*. The recovery plan identified *Eucalyptus globulus* (blue gum), *E. camaldulensis* (red gum), *Carpobrotus edulis* (fig-marigold), *Conocosia pugioniformis* (narrowleaf iceplant), *Ehrharta calycina* (veldt grass), and other nonnative grasses (e.g., *Bromus* spp. (brome), *Lolium* spp. (ryegrass), *Avena* spp. (oats)) as affecting the Los Osos area. The 2009 5-year review for *Eriodictyon altissimum* noted that habitat surrounding the Broderson occurrence had historically been affected by competition from invasive, nonnative plants, particularly *Ehrharta calycina*, but did not state that nonnative plants posed a significant threat to *Eriodictyon altissimum*.

Since the time of the 2009 5-year review, we have received additional information documenting impacts of nonnative plants on *Eriodictyon altissimum* and its habitat. The primary invasive, nonnative species of concern is *Ehrharta calycina*, a perennial, nonnative species that spreads rapidly from a persistent seedbank as well as vegetatively. *Ehrharta calycina* substantially changes the plant community composition in invaded habitats, altering fire potential by buildup of dense thatch during the summer months, and increasing the rate of organic matter accumulation (TNC 2005, p. 6; CalIPC 2012). The density of veldt grass in habitat in the Los Osos area has increased greatly in past decades (SWAP 2000). It is extremely difficult to eradicate once it has become established (Bossard *et al.* 2000 pp. 164–170). Based on reports from local biologists, *Ehrharta calycina* is having a negative effect on habitat that supports *Eriodictyon altissimum* in the Los Osos area (CalIPC 2000, SWAP 2001; MBNEP 2010; Chestnut 2012b, pers.

comm.), which is the portion of the species range that supports three of the five extant occurrences. *Ehrharta calycina* is also prevalent in coastal dune scrub that transitions into maritime chaparral at the site of the extirpated Broderson occurrence, and it is encroaching into and modifying the maritime chaparral near the location of the extirpated Morro Dunes occurrence (Vanderwier 2012, pers. obs.).

Ehrharta calycina responds aggressively after fires or other disturbance activities (such as mechanical clearing) (CalIPC 2011, p. 4; Chestnut 2012a, pers. comm.); thus, seedlings of *Eriodictyon altissimum* would likely be in direct competition with, and could be overwhelmed by, *Ehrharta calycina*. This competition could result in poor seedling survival and low recruitment rates of *Eriodictyon altissimum*. At least one local botanist (Chestnut 2012a, 2012b, pers. comm.) considers that, based on its encroachment into the chaparral habitat that supports *Eriodictyon altissimum*, the presence of *Ehrharta calycina* in and around the Los Osos area is at this time significantly impacting the extant occurrences of *Eriodictyon altissimum*; he also states that the encroachment of *Ehrharta calycina* would continue or expand in the case of a major fire. Other local conservation organizations are documenting the spread of *Ehrharta calycina* into the Los Osos and Indian Knob areas, and express concern over the way this invasive species is converting chaparral habitat to grasslands and the potential it has outcompete endemic species (SWAP 2001, pp. 1–2; MBNEP 2010, p.2). There is no long-term strategy being implemented to control or manage *Ehrharta calycina* (Chestnut 2012a, pers. comm.), though Montaña de Oro State Park, which contains two occurrences of *Eriodictyon*

altissimum, is monitoring the spread of this invasive species, and has conducted some limited removal efforts in the past (CDPR 2013, no page number).

Because this nonnative, invasive grass occurs at all five occurrences in the Los Osos area that currently or historically have supported *Eriodictyon altissimum*, and because there is no management plan in place, we consider *Ehrharta calycina* to pose a significant threat to the continued existence of *Eriodictyon altissimum*. See additional discussion in the “Competition from Nonnative Plant Species” section of the species report (Service 2013, pp.11–14).

Small Population Size and Limited Distribution

Eriodictyon altissimum is known from a very limited area, with only five extant occurrences in two geographic areas approximately 13 mi (20.9 km) apart. At the time of listing, effects related to small population size were not discussed, though the 2009 5-year review did recognize that species that have very few locations or are from small and highly variable populations are considered to be vulnerable to stochastic extinction (Shaffer 1981, pp. 131–134; Primack 1998, pp. 279–308). Species with few populations or few individuals are vulnerable to the threat of naturally occurring random events, as these events can cause extinction through mechanisms operating at either the genetic, population, or landscape level (Shaffer 1981, pp. 131–134; Primack 1998, pp. 279–308). When such species occur within a limited geographic distribution, they also face a greater likelihood that all of the populations or individuals within the populations will be affected

by the same event (Factor E). Five occurrences of *E. altissimum* are currently considered extant, and three of these consist of fewer than 50 individuals (Service 2013, Table 1). All occur within just 13 mi (20.9 km) of each other. Therefore, *E. altissimum* may be at risk from threats related to small population size and limited distribution.

In the absence of information identifying threats to the species and linking those threats to the rarity of the species, we do not consider rarity or small populations alone to be a threat. However, *E. altissimum* possesses life-history characteristics that make it vulnerable to threats due to small population size (i.e., its clonal nature and suspected self-incompatibility) (see **Background** section above). Plants present in a population that consists of a single clone probably only receive compatible pollen through long-distance gene flow, whereas plants in multiclonal populations are more likely to receive some compatible pollen from nearby genotypes in the population (Elam 1994, pp. 146–194). If *E. altissimum* is also self-incompatible, the distance between occurrences could make it difficult for cross-pollination to occur, resulting in limited seed set that could have a negative effect on the establishment of a viable seed bank and species recovery after fires. Loss of genetic diversity due to small population sizes can result in reduced fitness of individuals and may reduce the adaptive capability of a species to respond to changing environmental conditions (Gilpin and Soulé 1986, pp. 32–33; Lesica and Allendorf 1995, p. 756).

Therefore, based on the limited distribution of the species, and its likely limited genetic diversity, we consider threats related to small population size and limited

distribution to impact *Eriodictyon altissimum*. See additional discussion in the “Small Population Size and Limited Distribution” section of the species report (Service 2013, pp. 13–14).

Altered Fire Regime

Understanding fire frequency is essential to understanding the habitat and life-history requirements for *Eriodictyon altissimum*. At the time of listing and in the recovery plan, we assumed that fire was necessary for the persistence of *E. altissimum* and its habitat (59 FR 64613, December 15, 1994; Service 1998, p. 23). At historical fire frequencies, chaparral species are generally resilient to fire because they are well known to regenerate from either resprouting of perennial root crowns or germination of seeds in the soil when heated or exposed to smoke (obligate seeders and sprouters) (Lambert *et al.* 2010, p. 31). However, alterations to the historical fire frequency through either increasing or decreasing the time between events can affect a species’ viability and persistence by killing individual plants or altering the characteristics of the habitat that supports them (Zedler *et al.* 1983, pp. 815–816; Tyler 1996, pp. 2182–2183; Van Dyke *et al.* 2001, p. 2; Lambert *et al.* 2010, p. 31), including *E. altissimum*.

We do not possess specific information on the role fire plays in the persistence of *Eriodictyon altissimum* or the post-fire behavior for this species. However, inference from other species in the genus and other co-occurring species indicate that fire is likely a necessary habitat component. Absence of fire to cue seed bank germination and maintain

a mosaic pattern of vegetation with open areas that favor *E. altissimum* may contribute to its limited distribution and reduced numbers. Keeley (1992, p. 441) also noted the importance of variable fire regimes to maintain equilibrium in species composition. Seed viability in a seed bank after a fire is also an important factor (Lambert *et al.* 2010, p. 31). For example, in the co-occurring *Arctostaphylos morroensis*, post-fire densities can be relatively high (e.g., 45,000 seeds per square meter), but seed viability is generally very low (1-5 percent) (Odion and Tyler 2002).

Determining fire frequency is an important means of assessing ecosystem tolerances to fire return intervals. Alterations to the historic fire frequency, either increasing or decreasing the time between events, can affect a species' viability and persistence. Too long of a fire return interval could lead to the development of climax, closed canopy chaparral stands that would eventually have an adverse effect on populations of *Eriodictyon altissimum* by precluding expansion into otherwise suitable habitat and development of even-aged, senescent stands (stands in which the individuals are so old that their reproductive potential has been reduced) (Ne'eman *et al.* 1999, pp. 235–242). Fire events that are too frequent could kill individuals before they have had an opportunity to flower, set seed, and contribute to a seedbank. However, such calculations can be challenging as until the 20th century, records were not systematically kept (Keeley *et al.* 2012, p. 41). It is believed that the fire cycle was historically relatively long and likely was limited more by the number of ignition events than by fuels (Keeley *et al.* 2012, p. 119). Estimates of historic fire return intervals for the Monterey Bay area range from as short as 10 years to as long as 100 years or more (Greenlee and Langenheim

1990, p. 124) or between 50–85 years for fires recorded in coastal southern California and northern Baja California Mexico (Moritz *et al.* 2004, p. 68).

According to historical fire records, no natural or prescribed fires have occurred in the vicinity of the Indian Knob and Baron Canyon occurrences of *Eriodictyon altissimum* in the past 50 years (California Division of Forestry and Fire Protection 2012); therefore, the fire return interval for this area is unknown. It is possible that since the discovery of *E. altissimum* in 1961, we are still within a single fire frequency return interval in this area. Because of the lack of recent fire and the subsequent buildup of fuels, these occurrences could be very susceptible to intense wildfire (USDA 1984, pp. 46, 54).

Multiple prescribed and natural burns have historically occurred in the Los Osos area; however, few were in close proximity to *Eriodictyon altissimum* occurrences. The northern perimeter of a prescribed fire conducted in 2003 came within an estimated 0.2 mi (0.08 km) of the Water Tank occurrence (Veneris 2012, pers. comm.). In recent years, California State Parks has considered conducting prescribed burns in Montaña de Oro State Park in the vicinity of the Ridge Trail and Hazard South occurrences; however, broadcast burning is not considered feasible near these occurrences due to the adjacent residential communities, heavy fuel loads, and potential impacts to the federally threatened *Arctostaphylos morroensis* (Morro manzanita) (Walgren 2012, pers. obs.). This manzanita species has not recovered well from a prescribed burn in Montaña de Oro State Park in 1998 (Odion and Tyler 2002).

According to Chestnut (2012a, pers. comm.), the plants in the Indian Knob area (most likely the Baron Canyon occurrence) have been affected by the construction of Baron Canyon Ranch, an estate home development. He states that landscaping, fire suppression treatments and similar development-driven activities are continuing to occur in this portion of the population with minimal oversight, based on his direct observations from the conserved lands at Guidetti Ranch adjacent to the Baron Ranch. The area around Indian Knob is largely undeveloped, although residential areas near Baron Canyon and other areas to the west could cause additional limitations for conducting prescribed burns in the future. The local community has previously expressed strong resistance to the idea of controlled burns in proximity to their properties, mostly due to concerns about fire escaping control and damaging structures (Vanderwier 2013, pers. obs.). Therefore, based on high fuel loads within chaparral habitat, proximity of residential communities, and possible impacts to federally listed species, attempts to restore the natural fire regime in *E. altissimum* habitat are not likely.

Little is known about the specific effects of fire on the life history of *Eriodictyon altissimum*. However, based on the best available scientific and commercial information, including characteristics of species with similar habitat and life-history characteristics, *E. altissimum* is likely dependent on fire for reproduction and persistence. The lack of recent fire and constraints on prescribed burns, therefore, pose a significant threat to the continued existence of the species. We also note that the level of impact this threat is having on *E. altissimum* could increase over time if prescribed burning and other fire

management measures continue to be limited. See additional discussion in the “Lack of Fire” section of the species report (Service 2013, pp.14–17).

Climate Change

The term “climate change” refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, usually decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species, including *Eriodictyon altissimum*. Specific effects of climate change on *E. altissimum* and its habitat depend on the magnitude of future changes. Analysis through Climate Wizard (2012) projects an increase in temperature and a decrease in rainfall; however, these changes are expected to be moderated somewhat by the species’ proximity to the coastline.

We recognize that climate change is ongoing and will likely affect a wide range of plant and animal species, as well as their habitats. However, we lack adequate information to make specific projections regarding the effects of climate change on *Eriodictyon altissimum* at this time. See additional discussion in the “Climate Change” section of the species report (Service 2013, pp. 17–18).

Existing Regulatory Mechanisms

Eriodictyon altissimum receives protection from multiple Federal, State, and local laws, particularly the Act, the California Endangered Species Act, and the California Coastal Act. Due to the status of *E. altissimum* as a State listed species and existing habitat conservation, we expect that *E. altissimum* will continue to receive protections even absent those of the Act. However, none of the existing regulations address the threat of nonnative, invasive grasses, nor do they address the need for restoration of a natural fire regime to support *E. altissimum* and its habitat.

Federal, State, and local regulations provide important protections for *Eriodictyon altissimum*, particularly through habitat conservation. However, other impacts to the species, such as competition with nonnative plants, small population size, and limited distribution can not necessarily be reduced or eliminated through the use of existing regulatory mechanisms. See additional discussion in the “Regulatory Mechanisms” section of the species report (Service 2013, pp. 20–23).

Combined Factors

The threats to the long-term persistence of *Eriodictyon altissimum* are compounded by their interactions with each other, particularly the interactions between the invasive, nonnative grass *Ehrharta calycina* and altered fire regimes. In addition to competing with and displacing native vegetation, nonnative grass species can increase both the volume of readily ignitable fuel and the seasonal duration when fuels are susceptible to ignition (Lambert *et al.* 2010, p. 31) in maritime chaparral where

Eriodictyon altissimum is found. The presence of *Ehrharta calycina* could change the frequency of fire due to increased biomass of fuels, changes in the distribution of flammable fuels biomass, and increased fuels flammability (Lambert *et al.* 2010, p. 29), thus causing more intense and damaging fires. Furthermore, *Ehrharta calycina* quickly germinates and re-establishes after fires and other disturbances (CalIPC 2011, p. 4). As such, it could out-compete seedlings of *Eriodictyon altissimum* that would emerge after a fire, particularly in the Los Osos area, where *Ehrharta calycina* is prevalent.

As invasive, nonnative species increase fire severity, the increased fires may promote the establishment and dominance of those species while making restoration to the original habitat conditions more difficult (CalIPC 2011, p. 4) as a result of changes in soil chemistry. The preponderance of seeds produced by the invasive, nonnative species can result in the site becoming quickly colonized by those species; in contrast, it may take 1 to 3 years before typical chaparral species (e.g., *Arctostaphylos morroensis*) are mature enough to produce seed (Odion and Tyler 2002, no page numbers). If an assertive, nonnative plant species control program is not instituted immediately after a fire that occurs within the range of *Eriodictyon altissimum*, it is possible the spread of *Ehrharta calycina* could swamp emerging *Eriodictyon altissimum* seedlings and other native chaparral species, resulting in the depletion of the seed bank and possible subsequent extirpation of occurrences, as well as alteration of the chaparral habitat that supports *Eriodictyon altissimum*. Therefore, based on the best available scientific and commercial information, we find that the cumulative and combined effects of altered fire regimes and invasive, nonnative plants pose a threat to *Eriodictyon altissimum* and its habitat. This is

compounded further by the small population sizes and limited distribution of *Eriodictyon altissimum*, making the species particularly vulnerable to stochastic events arising from the effects of altered fire regimes and invasive plant species.

Recovery and Recovery Plan Implementation

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include: “Objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of [section 4 of the Act], that the species be removed from the list.” However, revisions to the list (adding, removing, or reclassifying a species) must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is endangered or threatened (or not) because of one or more of five threat factors. Section 4(b) of the Act requires that the determination be made “solely on the basis of the best scientific and commercial data available.” Therefore, recovery criteria should indicate when a species is no longer an endangered species or threatened species because of any of the five statutory factors.

Still, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable

objectives against which to measure progress towards recovery, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of or remove a species from the Federal List of Endangered and Threatened Plants (50 CFR 17.12) is ultimately based on an analysis of the best scientific and commercial data then available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

In 1998, we finalized a recovery plan that included *Eriodictyon altissimum* (Service 1998), as well as other listed species. At that time, we only considered criteria for downlisting to threatened status, as so little was known about the species' genetics, biology, demography, or response to fire (Service 1998, p. 41). The plan stated that delisting criteria would be discussed at a future date, depending on the success of recovery efforts and of gathering additional management and life-history information (Service 1998, p. iii). According to the recovery plan, *E. altissimum* can be considered for downlisting when all three of the following criteria have been achieved: (1) At least five occurrences from throughout its range are on lands secure from human-induced threats; (2) surrounding habitat is protected in amounts adequate to permit management of the vegetation community using prescribed fire, if it is deemed beneficial to the species; and (3) populations are projected to be self-sustaining and either stable or increasing as determined by long-term monitoring and research results. These criteria are discussed in detail in the species report and summarized below.

Downlisting Criterion 1: At least five occurrences from throughout the species' range are on land secure from human-induced threats.

In the 2009 5-year review, we only recognized six occurrences of *Eriodictyon altissimum*, all of which were considered extant. Five of those occurrences were on lands that were conserved and managed, but the status of the sixth occurrence (Broderson) was uncertain. Though there were five occurrences conserved, due to concern over the uncertain status of the sixth occurrence, we judged that Criterion 1 had only been partially met (Service 2009, pp. 5–6).

Since that time, multiple surveys were conducted in areas historically known to support *Eriodictyon altissimum*. We now recognize seven occurrences of *E. altissimum*; however, due to increased survey data, we now consider two occurrences known at the time of listing to be extirpated (Service 2013, p. 4). Of the 5 extant occurrences, only four occurrences of *E. altissimum* are on land secured from development. The fifth extant occurrence of *E. altissimum* (Baron Canyon) is on private land in the Indian Knob area and is not currently protected from development. Development appears to have continued in the vicinity of this occurrence, and there also appears to be clearing of habitat nearby (Vanderwier 2012, pers. obs.).

Since the time of listing, important progress has been made in meeting Recovery Criterion 1. However, now that two occurrences of *Eriodictyon altissimum* are considered extirpated, there are only four extant occurrences of *E. altissimum* on

conserved lands, one fewer than at the time of the 2009 5-year review. Therefore, we do not consider this downlisting criterion to have been achieved.

Downlisting Criterion 2: Surrounding habitat is protected in amounts adequate to permit management of the vegetation community using prescribed fire, if it is deemed beneficial to the species.

In the 2009 5-year review, we considered this criterion to be no longer adequate and appropriate to the recovery of the species because: (1) The proximity of several occurrences to urban areas makes it unlikely that jurisdictions would implement prescribed burns in these areas; and (2) other methods (e.g., mechanical clearing of chaparral) may be available for managing the vegetation in a fashion that would allow maintenance of open areas needed for the continued survival of *Eriodictyon altissimum* (Service 2009, pp. 6–7).

Since the publication of the 5-year review, we have received substantial new information from the public and concerned scientists about the habitat that supports *E. altissimum*. Based on that information and on a thorough reevaluation of the best available scientific information, we have reconsidered the importance of fire to *Eriodictyon altissimum* and the chaparral habitat that supports it, and believe that fire rather than mechanical clearing is necessary to maintain proper habitat conditions and increase germination rates of *E. altissimum* (Service 2013, pp. 2–3, 16–17). Therefore, we now do consider this recovery criterion to be appropriate.

We do, however, still have concerns about the feasibility of conducting controlled burns within *E. altissimum* habitat. All of the occurrences of *E. altissimum* occur within 1 mi (1.6 km) of existing residential development. The Ridge Trail occurrence is the farthest from development at approximately 0.8 mi (1.3 km) south of residences. Habitat to the south of the Ridge Trail and Hazard South occurrences is protected within Montaña de Oro State Park. California State Parks has conducted prescribed burns within this 8,000-ac (3,200-ha) park but away from *E. altissimum* and its habitat; however, the locations of those burns are not adjacent to residential areas. It is unlikely that prescribed fire could be used at any of the Los Osos occurrences because of their proximity to residential areas and heavy fuel loads. The Water Tank occurrence is the closest to development, being within 150 ft (46 m) of a water tank and approximately 300 ft (107 m) from residences. This occurrence is bounded immediately to the north and east by the residential development, to the west and south by protected habitat within the Bayview Unit of the Morro Dunes Ecological Reserve and the County's Broderson parcel for a distance of at least 1 mi (1.62 km), and to the south by at least 7 mi (11.3 km) of chaparral and other habitat protected within Montaña de Oro State Park. The Indian Knob and Baron Canyon occurrences are also within close proximity to large residential estates.

While the Ridge Trail and Indian Knob occurrences are within a landscape that is likely large enough in size to allow for the use of prescribed burns for *Eriodictyon altissimum*, the public is concerned about the threat of fire, whether it is from natural

causes or prescribed as a management tool (Vanderwier 2013, pers. obs.). We will continue to investigate the potential for fire to be used in habitat that supports *E. altissimum*, and also consider other management options to meet the challenges posed by the use of controlled burns. Therefore, for these occurrences, we consider that prescribed burns could be used as a management tool for habitat that supports *E. altissimum*; however, because it has not been used at any of the occurrences, we do not consider this downlisting criterion to have been achieved.

Downlisting Criterion 3: Populations are projected to be self-sustaining and either stable or increasing as determined by long-term monitoring and research results.

At the time of the 2009 5-year review was being drafted, efforts were increased to survey for occurrences of *Eriodictyon altissimum*; these were the first surveys in over 20 years at the Broderson and Morro Dunes occurrences. However, despite searches conducted by local botanists and agency personnel familiar with the locations (McLeod 1986; Walgren 2009, pers. obs.; Vanderwier 2006, 2009, pers. obs.; County of San Luis Obispo 2010, p. 28; Vanderwier 2012, pers. obs.), *E. altissimum* was not detected at these two locations. Since it has not been detected at the Broderson occurrence since 1979 or at the Morro Dunes occurrence since 1985, we now consider those two occurrences to be extirpated. Furthermore, the number of individuals reported for each of the extant Los Osos occurrences (Ridge Trail, Hazard South, and Water Tank) has not increased since their detection in the area in 1972 (Service 2013, Table 1). Additionally, anecdotal information indicates that the Indian Knob occurrence did not increase noticeably

between the 1990s and 2006 (Vanderwier 2006. pers. obs.). As we do not possess data from long-term monitoring or research, it is not possible for us to know if the currently extant occurrences are self-sustaining, stable, or increasing. We do conclude, however, that two of the occurrences (Broderson and Morro Dunes) considered extant at the time of listing are likely now extirpated. Therefore, we conclude that this downlisting criterion has not been achieved, a conclusion that we also reached in the 2009 5-year review (Service 2009, p. 7).

Overall, these and other data that we have analyzed indicate that though some progress has been made toward meeting the first downlisting criteria (habitat protection), the other two downlisting criteria (surrounding habitat is protected in amounts adequate to permit management of the vegetation community using prescribed fire, and populations are projected to be self-sustaining and either stable or increasing as determined by long-term monitoring and research results) have not been met.

Additional information on recovery and recovery plan implementation are described in the “Recovery Progress” section of the species report (Service 2013, pp. 39–43).

Finding

An assessment of the need for a species’ protection under the Act is based on whether a species is in danger of extinction or likely to become so because of any of five

factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. As required by section 4(a)(1) of the Act, we conducted a review of the status of this plant and assessed the five factors to evaluate whether *Eriodictyon altissimum* is endangered or threatened throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the species. We reviewed information presented in the 2011 petition, information available in our files and gathered through our 90-day finding in response to this petition, and other available published and unpublished information. We also consulted with species experts and land management staff with California Department of Fish and Wildlife (CDFW), California Department of Parks and Recreation (CDPR), the County of San Luis Obispo, the City of San Luis Obispo, and local biologists who are actively managing *Eriodictyon altissimum*.

In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the threat is. If the threat is significant, it may drive, or contribute to, the risk of extinction of the species such that the species warrants listing as endangered or

threatened as those terms are defined by the Act. This does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of endangered or threatened under the Act.

Due to increased conservation and management, the primary threat impacting *Eriodictyon altissimum* at the time of listing has been largely reduced and is no longer posing a substantial threat to the species and its habitat. The 2009 5-year review recognized the threat from loss of habitat that was anticipated to result from residential development, surface mining, and oil well drilling has largely receded; thus, we recommended reclassification of *E. altissimum* from endangered to threatened. However, since that time, we have received substantial new information about threats impacting *E. altissimum*. Additionally, surveys of *E. altissimum* since 2009 indicate two occurrences considered extant in 2009 are likely extirpated, reducing the number of extant occurrences to five.

New information received since the 2009 5-year review indicates threats to *Eriodictyon altissimum* from invasive, nonnative species (Service 2013, pp. 11–13). Observations by local botanists and other knowledgeable persons indicate that the habitat surrounding the Los Osos area occurrences is being negatively affected by competition

from invasive, nonnative plant species, in particular *Ehrharta calycina* (Factor A). *Ehrharta calycina* in the Los Osos area has the ability to spread rapidly if a fire occurs, thus potentially outcompeting *Eriodictyon altissimum* in post-fire conditions (Factor E). Because invasive, nonnative species (particularly *Ehrharta calycina*) currently affect three of five extant occurrences, and due to the lack of management to counter the spread of *Ehrharta calycina* and other invasive, nonnative grasses, we find this threat impacts *Eriodictyon altissimum* and that it is contributing to the overall impacts that place this species in danger of extinction throughout all of its range.

Altered fire regime (Factors A and E) is also affecting the continued existence of *Eriodictyon altissimum*. Fire has largely been absent in *E. altissimum* habitat across its range in recent years, resulting in a buildup of fuel in an already highly fire-susceptible habitat. Furthermore, restrictions on controlled burning within habitat that supports *E. altissimum* are likely to continue due to the presence of other listed species and residential development within *E. altissimum* habitat. Both *E. altissimum* and its habitat require periodic fire, though the specific fire return interval is uncertain for *E. altissimum*. Therefore, we find that the altered fire regime is negatively affecting *E. altissimum* and is contributing to the overall impacts that place this species in danger of extinction throughout all of its range.

Altered fire regimes and invasive, nonnative species work in synergy to increase threats to *Eriodictyon altissimum* (Factors A and E). The proliferation of nonnative grasses in chaparral habitat increases the likelihood of high intensity wildfire, while

increases in high intensity wildfires increase the ability of nonnative grasses to invade recently burned areas and outcompete native chaparral species, such as *E. altissimum*. Therefore, we find that the combination of fire and invasive, nonnative grasses exacerbate the overall degree of impacts that threaten the continued survival and recovery of *E. altissimum*.

Eriodictyon altissimum is also threatened by small population size, particularly given the clonal nature and suspected self-incompatibility of the species (Factor E). The remaining three occurrences in the Los Osos area currently consist of fewer than 50 individuals and the entire range of the species is estimated to be 90 mi² (233 km²) or less; thus, the combined effect of small population size and a limited distribution makes *E. altissimum* vulnerable to stochastic events that could result in the extirpation of these occurrences (Factor E). Additionally, though existing regulatory mechanisms are providing important protections to *E. altissimum* and its habitat, there are not any mechanisms in place that can address the threat of altered fire regime and invasive, nonnative grasses (Factor D). Climate change (Factors A and E) may also impact the species; however, we lack specific data to project how climate change will affect *E. altissimum* and its coastal chaparral habitat. We did not find any evidence that threats attributable to Factor B (overutilization for commercial, recreational, scientific, or educational purposes) or Factor C (disease or predation) are currently impacting the species.

In conclusion, we have carefully assessed the best scientific and commercial

information available regarding the past, present, and future threats faced by this species. After review of the information pertaining to the five statutory factors, we find that ongoing threats are of sufficient imminence, intensity, and magnitude to indicate that *Eriodictyon altissimum* is presently in danger of extinction throughout all of its range. Therefore, we find that *E. altissimum* continues to meet the definition of an endangered species (i.e., is likely to become in danger of extinction throughout all or a portion of its range).

National Environmental Policy Act

We determined we do not need to prepare an environmental assessment or an environmental impact statement, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this finding is available on the Internet at <http://www.regulations.gov> under Docket No. FWS–R8–ES–2013–0116 or upon request from the Deputy Field Supervisor, Ventura Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this finding are the staff members of the Pacific Southwest Regional Office and the Ventura Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authority

The authority for this section is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: November 27, 2013

Signed: Rowan W. Gould

Acting Director, U.S. Fish and Wildlife Service

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